

REMARKS

Reconsideration of this application is respectfully requested.

Claims 40, 41 and 46 have been cancelled simply to reduce the number of issues presented for consideration. The rejection of these claims under 35 USC 112, second paragraph, is therefore moot.

The present claims are patentable over Park, whether considered alone or in combination with Matero.

The Office Action admits that Park fails to teach dose levels for processes gasses used in a deposition process. See office Action at page 3. However, the Office Action then proceeds to state that either such doses are inherent in the process taught by Park (based on conclusions regarding the film growth rate reported in the reference) or that selecting such doses would have been obvious to one of ordinary skill in the art to “reap the benefits of increase (sic) film deposition efficiency”. Office Action at pp. 3-4. This conclusion is flawed.

First, there is nothing inherent about the amount of precursor used in the process reported by Park. As is well known in the art, ALD is a process that exhibits self-limiting growth rate beyond a certain precursor dose or pulse time (for a given precursor flux). The point at which the growth rate no longer increases for increasing precursor dose is known as saturation. Therefore, without knowing the precursor dose (which Park does not report), it is not possible to conclude that Park is not operating at or beyond saturation. In contrast, claim 1 specifically recites a dose of the first chemically reactive precursor that is under-saturated.

Second, there is nothing to support a conclusion that it would be obvious for one of ordinary skill in the art to use an under-saturated dose of any precursor in order to maximize film deposition efficiency. Certainly Park provides no suggestion that this would be beneficial and historically, the success of ALD has relied on operating in the over-saturated zone. See Specification at para. [0008]. Therefore, if anything, one of ordinary skill in the art would likely conclude that Park is operating with a precursor flux suitable to achieve at least saturation for the exposure times reported and adopt doses in line with that expectation. This would yield a process different from that recited in claim 1.

Adding the teachings of Matero et al. does not alter this conclusion. Matero indicates that while film uniformity was substantially similar for both large and small water doses, the film growth rate was “substantially higher” for large water doses. See Matero, Abstract and

Section 3.1, p.3. Therefore, if anything, the teachings of Matero would lead one of ordinary skill in the art to use a large water dose when seeking to increase the film deposition rate, not to use an under-saturated water dose.

Accordingly, the present claims are patentable over Park, whether considered alone or in combination with Matero.

If there are any additional fees associated with this communication, please charge
Deposit Account No.: 19-3140.

Respectfully submitted,
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